DOCUMENT RESUME

ED 168 444 HE 011 166

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TITLE Young Doctoral Faculty in Science and Engineering: Trends in Composition and Research Activity. Higher Education Panel Report Number 43.
INSTITUTION American Council on Education, Washington, D.C. Higher Education Panel.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.; National Science Foundation, Washington, D.C.; Office of Education (DHEW), Washington, D.C.
PUB DATE Feb 79
CONTRACT SRS-78-16385
NOTE 57p.; Tables may be marginally legible due to small type
AVAILABLE FROM Higher Education Panel, American Council on Education, One Dupont Circle, Washington, DC 20036

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *College Faculty; *Doctoral Degrees; Employment Trends; *Engineering; *Financial Support; Higher Education; National Surveys; Questionnaires; *Research Opportunities; *Scientific Research; Scientists; Trend Analysis

ABSTRACT

A study was conducted to determine the proportion of young doctoral faculty (i.e., received the Ph.D. within the past seven years), the extent of their activity in seeking research support, and the possible reasons for any slackening in their search for support in recent years. Trends based on earlier surveys on the same topic are analyzed. Department heads were also asked to estimate the number of faculty they expected to hire for 1978-79. The survey was limited to colleges and universities that award the Ph.D. degree, and inquiries were directed to departments in 16 science and engineering fields. Usable responses were recieved from 203 of 235 institutions and 1,366 of 1,684 departments. National estimates were derived from survey responses by a weighting procedure. Results of the survey were weighted to cover 1,809 doctorate-level departments at 288 institutions. In 1977-78, 24 percent of the full-time doctoral faculty of these departments were defined as young. The data show that the proportion of young doctorates in science and engineering departments continues a pattern of decline evident in three previous surveys going back to 1968. On the average the young faculty members submit research proposals with greater frequency than do the senior faculty, and they are only slightly less successful than their senior colleagues in obtaining funds for the research proposals. Statistical data and a sample survey are presented. (SW)

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Young Doctoral Faculty in Science and Engineering: Trends in Composition and Research Activity

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ED168444

HIGHER EDUCATION PANEL REPORT, NUMBER 43
AMERICAN COUNCIL ON EDUCATION

FEBRUARY
1979

A Survey Funded by the National Science Foundation, the U. S. Office of Education, and the National Institute of Education

HE 011 166

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The Higher Education Panel's surveys on behalf of the Federal Government are conducted under contract support provided jointly by the National Science Foundation, the National Institute of Education, and the U. S. Office of Education (NSF Contract SRS-78-16385).

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Young Doctoral Faculty in Science and Engineering:

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Higher Education Panel Reports
Number 43 February 1979

American Council on Education
Washington, D.C. 20036

This material is based upon research supported by the National Science Foundation, the U.S. Office of Education, and the National Institute of Education under Contract SRS-78-16385.

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Acknowledgments

This survey builds on several earlier studies conducted for or by the Division of Science Resources Studies at the National Science Foundation.

Charles H. Dickens and Felix H. I. Lindsay of the Supply and Education Analysis Group of that Division were instrumental in developing the current and the earlier surveys.

The Federal Advisory Board and its Technical Advisory Committee also helped in guiding the survey as did the HEP Advisory Committee at the Council.

We particularly wish to thank the more than 1,300 department heads who responded to this inquiry and to our representatives at the institutions that make up the Higher Education Panel. Their assistance and continued cooperation are deeply appreciated by both our sponsors and the staff.

Highlights

Doctoral Faculty 1977-78

- There were nearly 36,000 full-time doctoral faculty in science and engineering departments at Ph.D.-granting institutions.
- Of the total, 24 percent were considered "young", i.e., they had received their doctorate within the past seven years.
- The proportion of young doctoral faculty was higher at private than at public institutions (27 percent versus 23 percent).
- Departments of sociology, economics and psychology had relatively high proportions of young doctorates among their faculties (32 percent or more); physics, botany, biochemistry, and chemistry each had relatively low proportions (17 percent or less).

New Faculty 1978-79

- Nearly 3,000 full-time doctoral faculty members were expected to be hired for 1978-79.
- Seventy percent of the positions will be filled at the rank of assistant professor; 12 percent will be hired as associate professors; and 10 percent, full professors.

Links with Earlier Surveys

- In all departments except economics, the proportions of young doctoral faculty in 1977-78 fell short of the proportion considered desirable by department heads in a 1975 survey.
- Between 1974 and 1978, the proportion of young doctorates among full-time doctoral faculty declined in all fields included in both surveys.
- Between 1974 and 1978, the proportions of young doctorates in departments of electrical engineering and physics dropped by one-third: to 20 percent and 13 percent, respectively.
- In 1968, young doctorates made up 43 percent of full-time doctoral faculty; in 1974, 29 percent; in 1975, 26 percent.

Research Activity

- Young doctoral faculty submitted an average of one research proposal each, compared with 9 proposals for each 10 of total doctoral faculty during the period July 1976 through June 1977.
- Young doctoral faculty had a success rate of 63 percent of the research proposals acted upon before June 1978, compared with 67 percent for senior faculty, in getting their proposals funded.
- Forty-seven percent of department heads felt that young doctoral faculty were more likely now to apply for outside research support than they had been five years ago, 38 percent felt they were about as likely, and 15 percent, less likely.

Background

Many observers have expressed concern that declines in the proportion of young doctorates on science and engineering faculties will adversely affect the vigor of teaching and research in those fields. Earlier surveys, conducted by or at the request of the National Science Foundation, document a persistent downward trend in that proportion. Moreoever, recent legislation raising the age for mandatory retirement may result in a slowdown in faculty retirements during the 1980s, further eroding the representation of young doctorates. These possibilities underscore the need to update our information about young doctorates and their prospects for teaching and research roles in higher education.

This survey continues the exploration of faculty composition in science and engineering departments at Ph.D.-granting institutions. Conducted at the request of the National Science Foundation, the inquiry included questions about the proportion of young doctoral faculty, the extent of their activity in seeking research support, and the possible reasons for any slackening in their search for support in recent years. Department heads were also asked to estimate the number of faculty they expected to hire for 1978-79. This report summarizes the results of the survey, giving special attention to the links between these results and those of earlier surveys on the same topic.

Methods Summary

The Higher Education Panel was created in 1971 by the American Council on Education for the purpose of conducting limited-scale surveys on topics of current policy interest to the higher education community and to government agencies. The Panel is a disproportionate stratified sample of 760 colleges and universities drawn from the more than 3,000 institutions listed in the National Center for Education Statistics'

Education Directory. Each institution in the population is classified in terms of the set of variables constituting the Panel's stratification design that includes control, type, and size. For any given survey, either the entire Panel or an appropriate subset may be used.

This survey was limited to colleges and universities that award the Ph.D. degree. The survey instrument (Appendix A) was mailed on May 5, 1978, to the 235 Panel institutions that met this criterion. Individual inquiries were directed to the heads of the following doctorate-level science and engineering departments:

Biochemistry	Electrical engineering	Physics
Biology	Geology	Physiology
Botany	Mathematics	Psychology
Chemical engineering	Microbiology	Sociology
Chemistry	Mining and mineral engineering	Zoology
Economics		

Respondents from these departments were asked to indicate the numbers of full-time doctoral faculty employed in 1977-78 and the numbers regarded as "young" (defined as having held the doctorate for seven years or less), the outcomes of research proposals submitted during 1976-77, and expected hires in 1978-79. They were also asked for their opinions on the tendency of young faculty members to seek research support. After mail and telephone followup efforts, usable responses were received from 203 of 235 institutions and 1,366 of 1,684 departments, for response rates of 86 percent and 81 percent, respectively.

National estimates were derived from survey responses by a weighting procedure which assumed that, within each stratification cell, the departmental characteristics of Panel institutions are representative of the departmental characteristics among institutions in the eligible population. Weights were computed in two stages: The first stage adjusted for nonresponse among departments within the responding institutions in each cell, and the second stage adjusted for institutional nonresponse.

Weighted data are presented by institutional control (public, private). Unweighted data are shown for the responding departments rated distinguished or strong according

to the Roose-Andersen study[1], and for the twenty largest responding departments in terms of faculty size. Also unweighted are data linking this survey with earlier HEP and NSF surveys on the numbers of total and young doctoral faculty.

Findings

Results of the survey were weighted to cover 1,809 doctorate-level departments in sixteen different science and engineering fields at 288 Ph.D.-granting institutions. In 1977-78, the full-time doctoral faculty of these departments numbered almost 36,000 persons (Table 1). Of these, about 8,700 (24 percent) were defined as *young* (i.e., they had received the doctorate within the previous seven years).

As the summary table below (Table A) shows, the proportion of young doctoral faculty was somewhat higher at private than at public institutions (27 percent versus 23 percent):

[1]The Roose-Andersen ratings represent a summary of the assessments provided by 4,000 faculty members in 37 disciplines at 131 major institutions who rated as many of the major institutions offering doctoral study in their disciplines as they felt competent to judge. Specifically, respondents were asked to select from a given set of terms the one they felt best described the quality of graduate faculty and the effectiveness of the doctoral program, and to indicate the degree of change they perceived in the relative position of departments. Average scores were calculated for each department at each institution, and the departments within each discipline were then rank-ordered.

In the summary ratings of graduate faculty, the highest-scoring departments were categorized as "distinguished." The next level was "strong," followed by "good," "adequate," "marginal," and "not sufficient for doctoral training." The top two categories were combined for separate tabulation. See Kenneth D. Roose and Charles J. Andersen, A Rating of Graduate Programs (Washington: American Council on Education, 1970).

Table A: Total and Young Doctoral Faculty

Setting	Number of Departments	Number of Faculty	Percentage Young Faculty
Public	1,210	26,314	23
Private	599	9,647	27
(Departments classified as distinguished or strong)	(229)	(6,453)	(23)

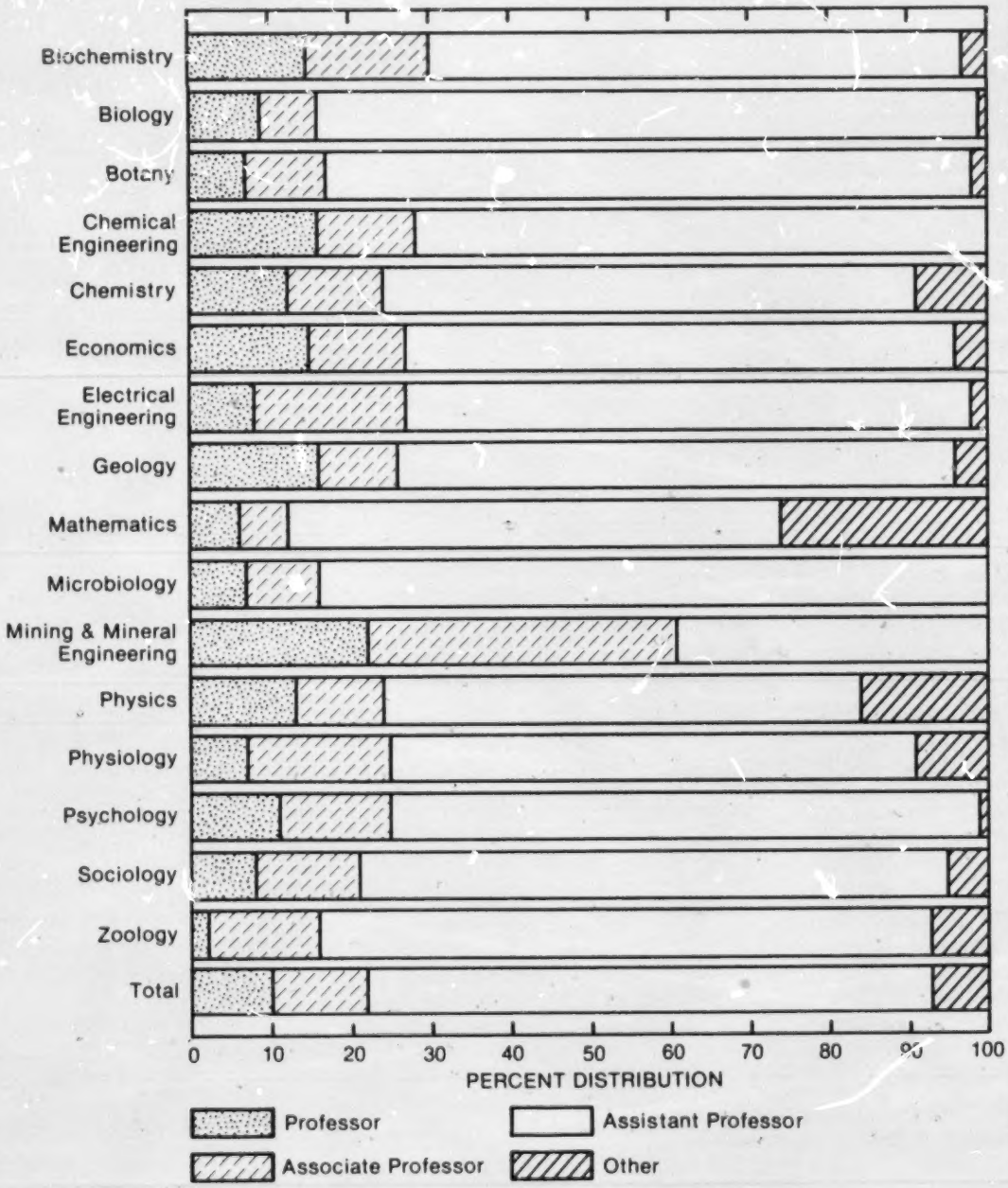
Among the sixteen fields covered by the survey, the proportions of young doctoral faculty were well below the overall average of 24 percent in departments of physics (13 percent) and of botany, biochemistry, and chemistry (17 percent in each), and well above the overall average in the three social science departments: sociology (36 percent), economics (34 percent), and psychology (32 percent). In general, these differences held for both public and private institutions as well as for the departments rated distinguished or strong (Tables 2-4). As will be noted in a later section, these differences are consistent with earlier surveys of faculty composition.

Expected Faculty Hires During 1978-79

To assess potential full-time employment opportunities for doctoral faculty, the questionnaire asked department heads to estimate the number and academic rank of faculty they would hire in 1978-79. In the 1,809 departments represented in the survey, almost 3,000 full-time doctoral faculty members were expected to be hired for the 1978-79 academic year, most of them (70 percent) at the rank of assistant professor (Tables 5-8). Only 10 percent of the expected vacancies were at the level of full professor, and only 12 percent at the associate professor rank. This distribution suggests that the great majority of faculty vacancies will be filled by people who have recently acquired the doctorate. The assistant professor rank is typically, although not invariably, assigned to young doctoral faculty who are in the early stages of their careers.

Chart I opposite summarizes how the expected hires for 1978-79 differed among fields.

Chart I: Distribution of Academic Ranks of Full-Time Doctorate Faculty Expected to be Hired for 1978-79



The expected hiring patterns suggest that those fields which in 1977-78 had a below-average proportion of young doctoral faculty will continue that underrepresentation in 1978-79. Physics, botany, biochemistry, and chemistry all reported that young doctorates constituted less than one-fifth of their full-time faculty. In 1978-79 each of these fields, except botany, is expected to hire above-average proportions at the full and associate professor ranks and below-average proportions at the assistant professor rank.

Comparisons with Earlier Surveys

In a Higher Education Panel survey conducted in 1975, department heads from the sixteen fields covered in the present survey were asked what they considered to be the most desirable proportion of young doctorates among their full-time doctoral faculties.[2] Their responses to this question are summarized in Table B below and compared with the proportions of young doctorates currently reported for these fields.

In all departments except economics, the proportion of young doctoral faculty in 1977-78 fell short of the proportion considered desirable by department heads responding to the 1975 survey.[3] The discrepancy was particularly marked in physics and biochemistry. The actual proportion of young doctorates among full-time faculty in 1977-78 was 13 percent in physics and 17 percent in biochemistry, about half of the desirable proportion. In psychology and sociology, however, the actual proportions were only 2 percentage points less than the desired percentages.

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[2] Frank J. Atelsek and Irene L. Gomberg, Young Doctorate Faculty in Selected Science and Engineering Departments, 1975 to 1980, Higher Education Panel Report No. 30, August 1976.

[3] This analysis assumes that the opinions of department heads about desired proportions of young doctorates have remained relatively stable since the 1975 survey.

Table B: Comparison of Desirable and Actual Proportions of Young Doctoral Faculty

Department	Department Heads' Opinions About Most Desirable Proportion of Young Doctoral Faculty* (Data from 1975 survey)	Proportion of Young Among Full-Time Faculty 1977-78	Difference Between Desired and Actual Percentages
Physics	27%	13%	-14
Biochemistry	31	17	-14
Botany	27	17	-10
Chemistry	26	17	-9
Electrical engineering	29	20	-9
Chemical engineering	27	21	-6
Geology	28	23	-5
Biology	30	23	-7
Microbiology	30	24	-6
Mining and mineral engrg.	32	24	-8
All departments	*30*	*24*	*-6*
Zoology	31	26	-5
Physiology	34	27	-7
Mathematics	31	27	-4
Psychology	34	32	-2
Sociology	37	36	-1
Economics	33	34	+1

*average (mean) for the field

Trends in Faculty Composition

The present survey makes it possible to update information on faculty composition reported in earlier surveys. In addition to the 1975 HEP survey, similar surveys were conducted by the National Science Foundation in 1968[4] and 1974[5]. Departmental responses to the current survey were matched with equivalent responses provided by the same departments in the earlier surveys. Table 9 shows trends in faculty composition

[4]National Science Foundation, Support and Research Participation of Young and Senior Academic Staff, 1968, NSF 68-31, 1968.

[5]National Science Foundation, Young and Senior Science and Engineering Faculty, 1974: Support, Research Participation, and Tenure, NSF 75-302, 1975.

among the 649 departments that provided data in the three surveys since 1974, and Table 10 shows trends among the 333 departments that responded to all four surveys since 1968.

Changes Since 1974. The proportion of young doctorates among the full-time faculty declined in all fifteen fields over the period 1974 through 1977-78.[6] In only two departments, biology and microbiology, was this downward trend temporarily reversed during the period between spring 1974 and December 1975. The sharpest drops occurred in departments of physics and electrical engineering: a decrease of 33.3 percent in the proportion of young doctorates among full-time faculty between spring 1974 and the 1977-78 academic year. As shown in the summary table below (Table C), departments in five other fields--botany, biochemistry, mathematics, psychology and sociology--had their proportions of young doctorates drop by one fourth or more over the same period.

Table C: Declines in Proportions of Young Doctorates Among Full-Time Doctoral Faculty Between Spring 1974 and 1977-78

Department	Number of Matched Departments Reporting	Proportion of Young Doctoral Faculty Spring 1974	Decrease in Percentage Points by 1977-78	Extent of Decline
Electrical engineering	51	29.1	-9.7	-33.3
Physics	81	19.8	-6.6	-33.3
Botany	17	25.7	-8.1	-31.5
Biochemistry	24	23.1	-7.2	-31.2
Psychology	66	42.5	-11.0	-25.9
Sociology	50	46.4	-11.6	-25.0
Mathematics	71	37.0	-9.2	-24.9
Physiology	9	33.6	-7.6	-22.6
All departments	*649*	*30.4*	*-6.7*	*-22.0*
Microbiology	13	24.0	-4.9	-20.4
Chemistry	90	21.8	-3.6	-16.5
Biology	42	28.1	-4.0	-14.2
Zoology	22	29.9	-3.2	-10.7
Economics	50	36.8	-3.7	-10.1
Geology	39	23.6	-1.4	-5.9
Chemical engineering	24	18.9	-0.6	-3.2

[6] The field of mining and mineral engineering was not included in the earlier NSF surveys.

Changes Since 1968. A more limited analysis was conducted of changes in faculty composition since spring 1968. Responses from the 333 departments in twelve fields that participated in all four surveys are summarized in Chart II.[7]

Overall, the proportion of young doctorates among full-time faculty in these Ph.D.-level science and engineering departments has declined steadily over the past decade. In 1968 young doctorates made up 43 percent of the full-time doctoral faculty. By the 1977-78 academic year, this proportion had dropped to 23 percent, an overall loss of almost half of their earlier representation.

The declines over the decade were especially precipitous in three fields. In electrical engineering and mathematics departments, young doctorates constituted the majority of faculty in 1968; but by the 1977-78 academic year, their proportions had declined by 32 and 24 percentage points, respectively. In physics departments, the proportion of young doctorates declined over the decade from 40 percent to 14 percent, a loss of almost two-thirds of their proportional representation. At the beginning of the period, the three social science fields also had relatively large proportions of young doctoral faculty members: sociology, 48 percent; psychology, 45 percent; and economics, 43 percent. Their proportionate losses, however, were much more moderate--15 or fewer percentage points each.

Seeking and Obtaining Research Support

Other major questions addressed in this survey related to the success of young doctoral faculty in competing for scarce research funds. How many of their research proposals were funded? How did their success rate compare with that of senior faculty in the same fields? Are they making fewer efforts to obtain funding now than they did in the past; and if so, for what reasons?

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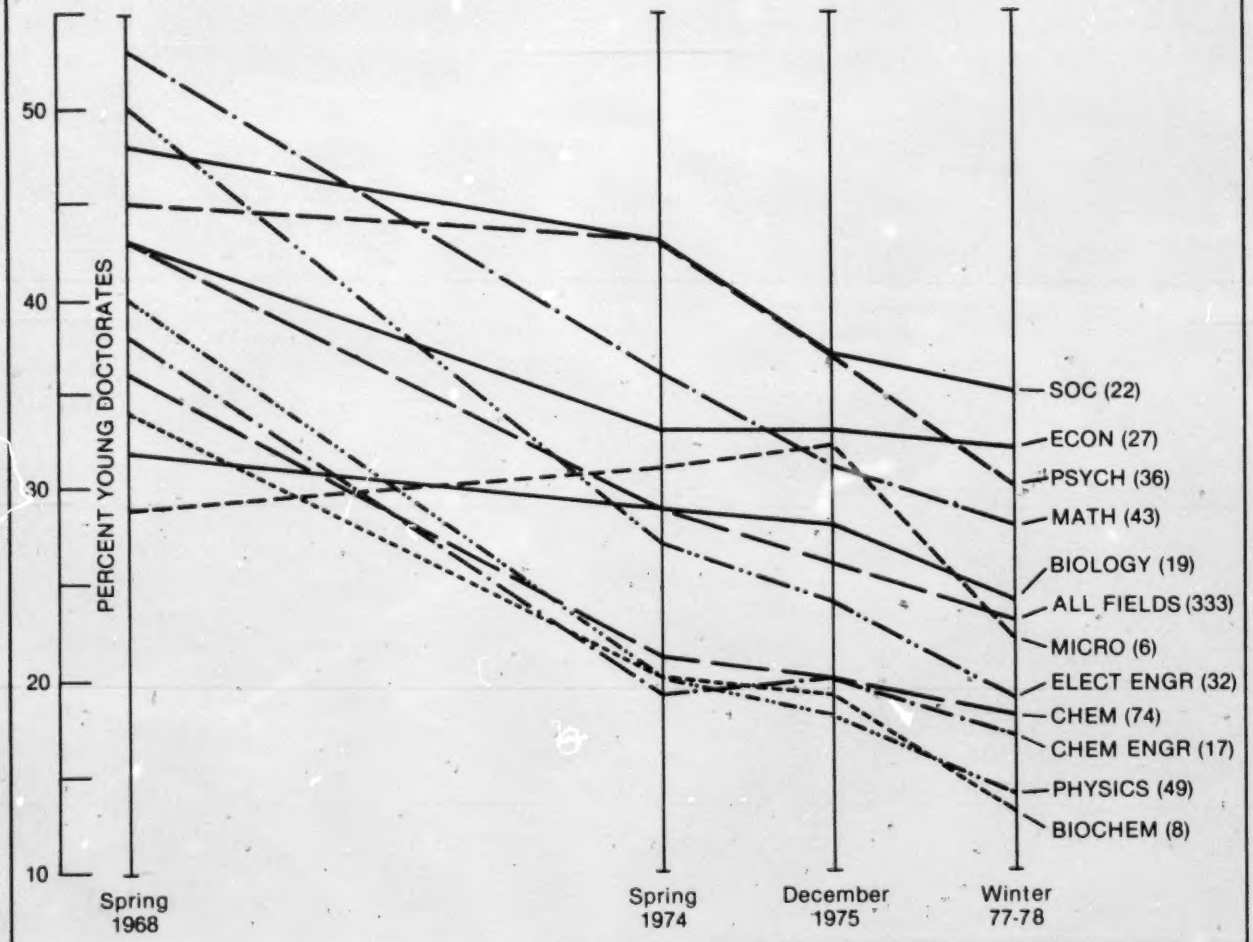
[7] The fields of botany, geology, and zoology, in addition to mining and mineral engineering were not included in the 1968 NSF study.

Chart II: Trends in Proportion of Young Doctorates Among Full-Time Faculty in Selected Science and Engineering Departments, Spring, 1968 — Winter, 1977-78



NOTE 1: Numbers in ( ) following fields refer to the numbers of departments that responded to all four surveys.

NOTE 2: The lines connecting the points are intended as visual aids only. The values for years between surveys may not lie on these straight lines.

Submitting Research Proposals. As Tables 11-14 show, on the average, young doctoral faculty submitted a greater number of research proposals than did doctoral faculty as a whole (one proposal per young faculty member, compared with 90 proposals for each 100 of total doctoral faculty). This difference holds for all but two fields, economics and electrical engineering, where the submission rates were about equal. In most of the other fields covered by the survey, the rate of proposal submissions by young doctoral faculty exceeded only slightly the rate for faculty as a whole. In botany, chemical engineering, and chemistry, however, the submission rate of the young faculty exceeded the overall average for the field by one-third or more.

To examine the influence of department size as measured in terms of number of faculty, Table 15 shows the status of research proposals for the 20 largest responding departments in each of the sixteen surveyed fields. Overall, these largest departments accounted for 29 percent of all the faculty represented in the survey, but a somewhat smaller proportion of the young doctoral faculty (26 percent). The submission of research proposals in the 20 largest departments followed the same general pattern which describes departments in general: On the average young doctoral faculty members submitted more proposals than the faculty as a whole (.98 versus .87 proposals per faculty member). Chart III summarizes the differences in proposal submission rates among the surveyed fields, comparing all full-time faculty with the young doctoral faculty members.

Success in Obtaining Funds. Tables 16-18 address a more important question: How successful were young doctoral faculty in getting their research proposals funded, compared with their senior colleagues?[8] In analyzing responses to this question, we considered only those proposals about which funding decisions had already been made.[9]

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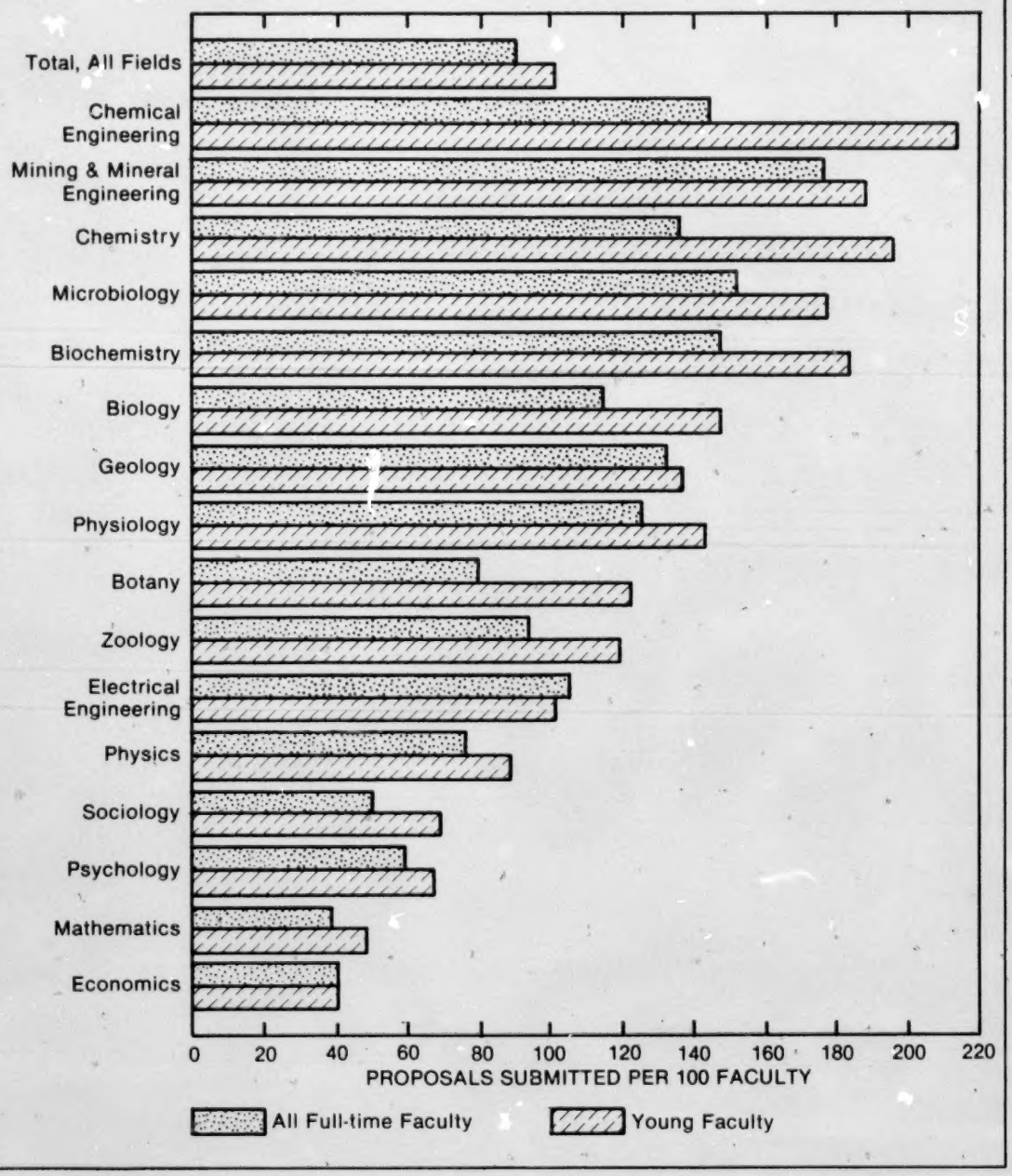
[8]Note the limitation in these data: Success in obtaining funding is measured only by the *number*, not the dollar amount, of the proposals funded.

[9]In all cases, at least 10 months had elapsed since the proposals had been submitted. Depending on the field, funding decisions had been made concerning 84 to 94 percent of the proposals submitted from July 1976 through June 1977.

Chart III: Number of Research Proposals Submitted by all Full-Time and Young Doctoral Faculty, July, 1976 Through June, 1977



In most of the 16 fields young doctoral faculty were less successful than senior faculty in getting their proposals funded. Chart IV compares the proportions of funded research proposals for senior faculty and for young doctoral faculty in all sixteen fields.

Overall, the success rate among the more than 27,000 senior faculty was 67 percent compared with 63 percent for the 8,700 young doctoral faculty. The difference was most pronounced in mining and mineral engineering: a high of 81 percent among the senior faculty compared with 60 percent among the young doctoral faculty. Other fields in which the senior doctoral faculty had markedly higher success rates than their younger colleagues included physiology (69 vs. 62 percent), mathematics (67 vs. 61 percent), electrical engineering (66 vs. 54 percent), and chemical engineering (60 vs. 52 percent).

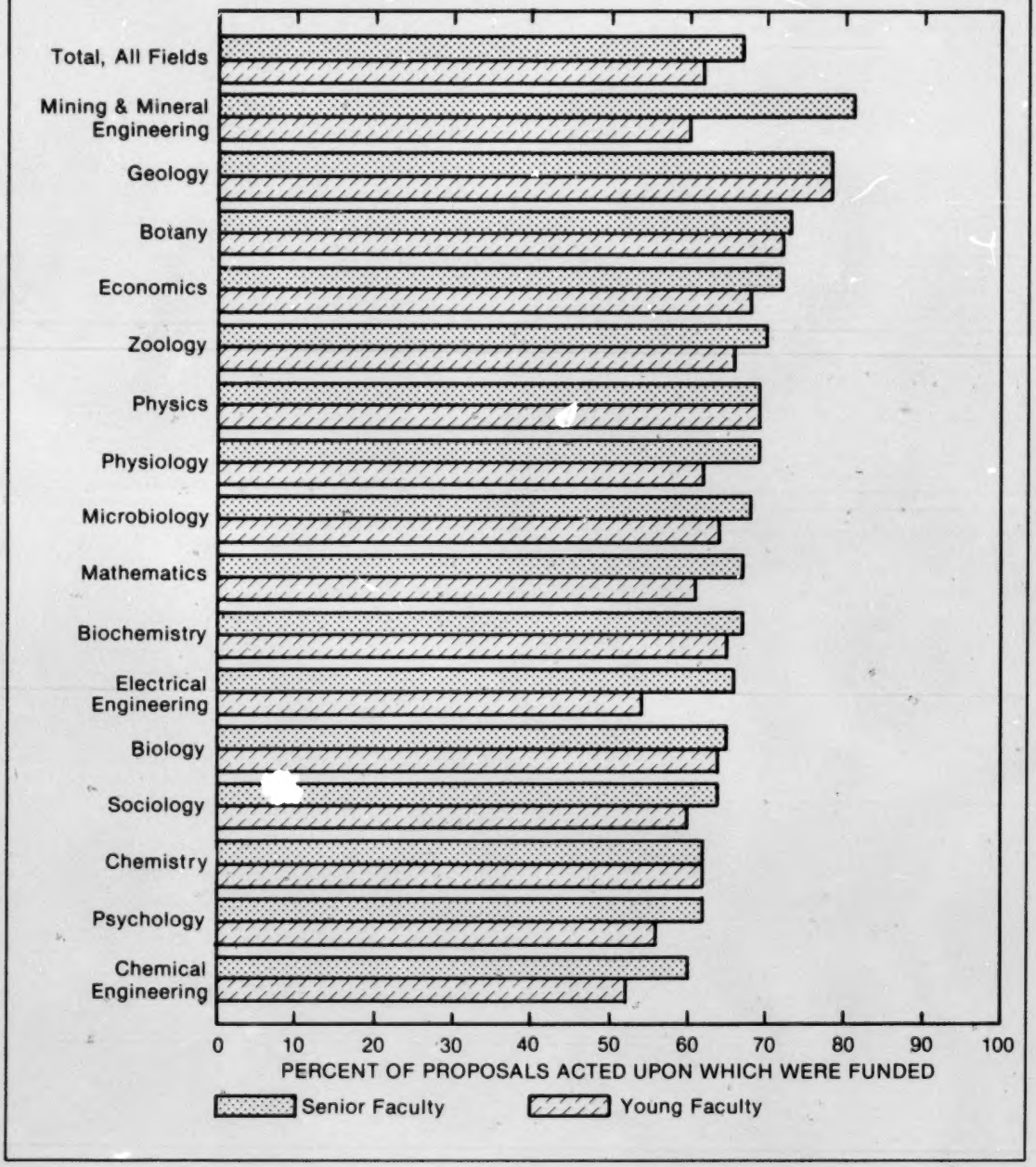
In the departments rated distinguished or strong, both senior and younger doctoral faculty had success rates--77 percent and 70 percent, respectively--that were well above the overall average for all departments--66 percent and 62 percent, respectively (Table 19). It is also notable that in four of the fourteen fields, young faculty members in distinguished and strong departments surpassed their senior colleagues with respect to having research proposals funded, as is shown in the table below:

Table D: Distinguished and Strong Departments in Which the Funding Success of Young Faculty Exceeded That of Their Senior Colleagues

	Percent Funding Success	
Department	Senior Faculty	Young Faculty
Biochemistry	78	85
Botany	73	84
Economics	75	90
Zoology	74	77

Assessments by Department Heads. Almost half (47 percent) of all department heads said that, in their opinion, young doctoral faculty members were even more likely now to apply for outside research support than they had been five years ago. Only one of

Chart IV: Success Rate of Research Proposals Submitted June 1976 — July 1977



every seven department heads thought that the young faculty were less likely to try for such outside support, while two out of five saw little change over the past five years. In general, department heads at public and private institutions differed little in their responses to this question. Responses are shown in detail in Tables 20-26 and summarized in Chart V.

Summary

These survey data show that the proportion of young doctorates in science and engineering departments continues a pattern of decline evident in three previous surveys going back to 1968. In consequence, the representation of young doctoral faculty in 1977-78 has dropped to 24 percent overall, and below 20 percent in four fields: physics, botany, biochemistry and chemistry. There is also some indication that the rate of decline is slowing; however, the recent changes in mandatory retirement laws will also affect the employment situation for new Ph.D.'s during the 1980's. The response of senior faculty to this new alternative is not yet clear.

In the short run this survey indicates that the number and kinds of faculty hires anticipated by department heads for 1978-79 will provide a moderate level of job opportunities for those recently completing the Ph.D. It is also apparent that young doctoral faculty have not diminished their involvement in the research process. On the average they submit research proposals with greater frequency than do the senior faculty, and they are only slightly less successful than their senior colleagues in obtaining funds for their research proposals.

Chart V: Department Heads' Opinions of the Likelihood of Young Doctoral Faculty to Apply for Independent Research Support Now As Compared With Five Years Ago

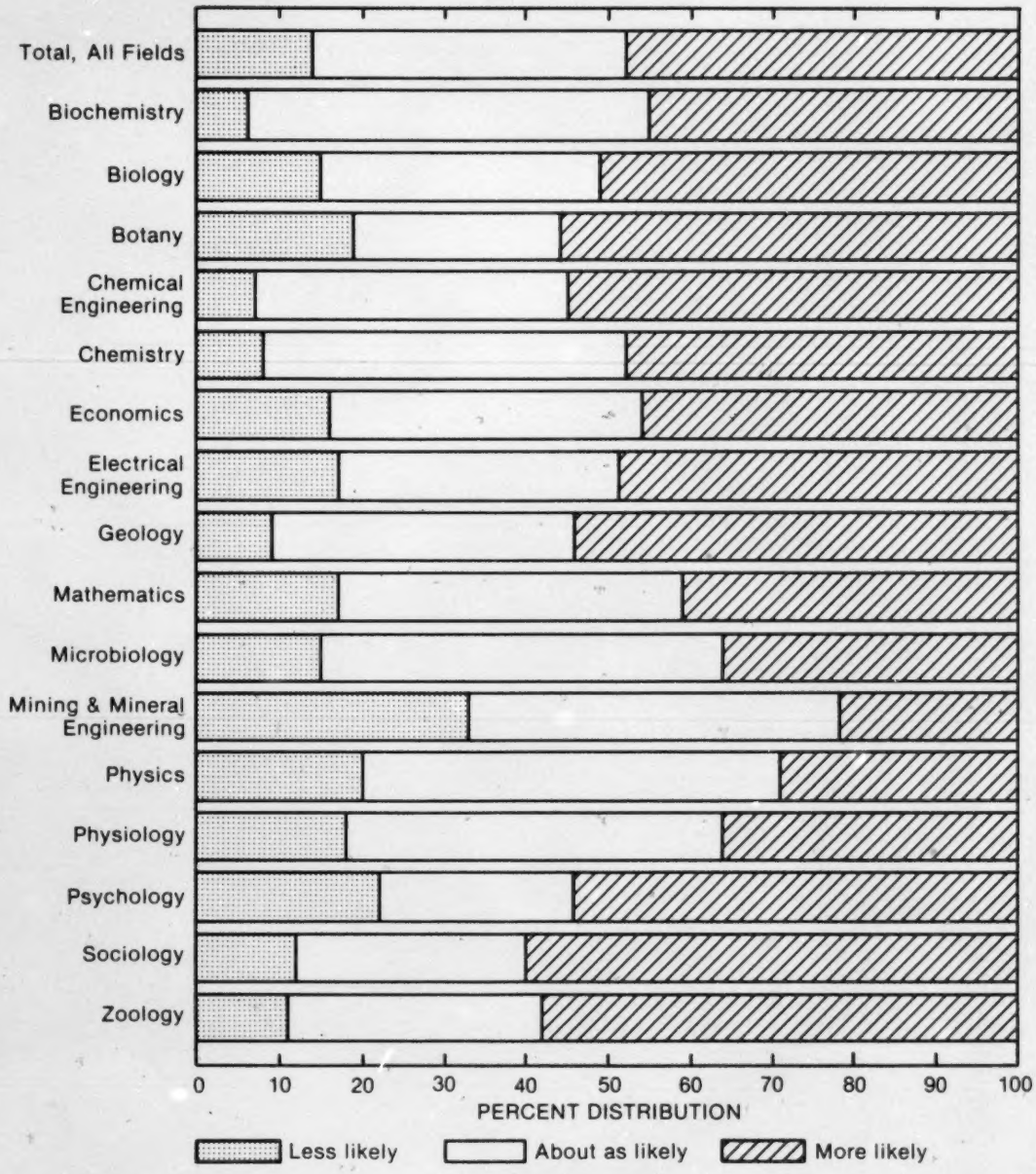


Table 1

Full-Time Doctoral Faculty and Young Doctoral Faculty in Selected Science and Engineering Departments, 1977-78: All Institutions (N=288)

Field	Number of Departments	Total Doctoral Faculty	Young Doctoral Faculty	
			Number	Percent of Total
Biochemistry	129	1,746	294	16.8
Biology	134	3,132	724	23.1
Botany	50	842	139	16.6
Chemical Engineering	96	994	208	21.0
Chemistry	183	3,994	690	17.3
Economics	115	2,468	845	34.2
Electrical Engineering	113	2,355	479	20.4
Geology	97	1,319	305	23.2
Mathematics	151	4,845	1,298	26.8
Microbiology	122	1,385	328	23.7
Mining and Mineral Engineering	11	108	25	23.9
Physics	156	3,781	488	12.9
Physiology	104	1,505	405	27.0
Psychology	174	4,344	1,382	31.8
Sociology	121	2,140	775	36.2
Zoology	47	998	259	26.0
All Fields	1,809	35,962	8,652	24.1

Note: Because each data item was separately weighted and rounded, subtotals generally approximate, but may not add exactly to, their corresponding totals. Reported percentages reflect the true proportions of the weighted numerical totals. Since the decimals associated with the numbers of faculty were eliminated without rounding, the percentages may not appear to be exact.

Table 2

Full-Time Doctoral Faculty and Young Doctoral Faculty in Selected Science and Engineering Departments, 1977-78 Public Institutions (N=162)

Field	Number of Departments	Total Doctoral Faculty	Young Doctoral Faculty	
			Number	Percent of Total
Biochemistry	79	1,194	186	15.6
Biology	77	2,150	465	21.7
Botany	46	777	130	16.7
Chemical Engineering	68	698	132	19.0
Chemistry	117	2,930	462	15.8
Economics	76	1,730	548	31.7
Electrical Engineering	77	1,590	324	20.4
Geology	69	1,017	222	21.8
Mathematics	102	3,758	967	25.7
Microbiology	80	965	211	21.9
Mining and Mineral Engineering	11	108	25	23.9
Physics	105	2,759	316	11.5
Physiology	63	1,021	264	25.9
Psychology	111	3,089	951	30.8
Sociology	79	1,591	559	35.1
Zoology	44	930	244	26.3
All Fields	1,210	26,314	6,013	22.9

Table 3

Full-Time Doctoral Faculty and Young Doctoral Faculty in Selected Science and Engineering Departments, 1977-78 Private Institutions (N=126)

Field	Number of Departments	Total Doctoral Faculty	Young Doctoral Faculty	
			Number	Percent of Total
Biochemistry	49	552	108	19.6
Biology	57	982	258	26.4
Botany	4	64	9	14.9
Chemical Engineering	27	296	75	25.6
Chemistry	66	1,063	227	21.4
Economics	39	738	296	40.2
Electrical Engineering	36	764	154	20.3
Geology	27	301	83	27.6
Mathematics	48	1,087	331	30.5
Microbiology	42	420	116	27.8
Mining and Mineral Engineering	0	-	-	-
Physics	51	1,022	172	16.9
Physiology	40	483	141	29.2
Psychology	62	1,254	430	34.3
Sociology	41	549	216	39.3
Zoology	3	67	15	22.7
All Fields	599	9,647	2,638	27.3

Table 4

Full-Time Doctoral Faculty and Young Doctoral Faculty in Selected Science and Engineering Departments, 1977-78: Departments Rated "Distinguished" or "Strong" in the Roose-Andersen Study (Unweighted)

Field	Number of Departments	Total Doctoral Faculty	Young Doctoral Faculty	
			Number	Percent of Total
Biochemistry	17	286	48	16.8
Biology[a]	-	-	-	-
Botany	9	234	22	9.4
Chemical Engineering	14	207	39	18.8
Chemistry	29	894	177	19.8
Economics	16	420	153	36.4
Electrical Engineering	20	750	150	20.0
Geology	17	314	72	22.9
Mathematics	18	853	225	26.4
Microbiology	13	219	44	20.1
Mining and Mineral Engineering[a]	-	-	-	-
Physics	19	774	23	15.9
Physiology	11	210	36	17.1
Psychology	24	769	215	28.0
Sociology	14	324	104	32.1
Zoology	8	199	51	25.6
All Fields	229	6,453	1,459	22.6

[a]The Roose-Andersen study did not include biology departments as designated in the present study or departments of mining and mineral engineering.

Table 5

Percentage Distribution of Expected Full-Time Faculty Hires by Rank, 1978-79: All Institutions (N=288)

Field	Total Hires Number	Total Hires Percent	Academic Rank: Professor	Associate Professor	Assistant Professor	Other
Biochemistry	177	100.0	14.6	14.5	67.9	3.0
Biology	202	100.0	9.0	6.8	83.0	1.2
Botany	53	100.0	7.3	9.9	80.4	2.4
Chemical Engineering	144	100.0	16.0	12.4	71.5	0
Chemistry	228	100.0	11.7	11.8	67.3	9.2
Economics	258	100.0	15.1	11.9	69.2	3.8
Electrical Engineering	257	100.0	8.1	18.6	71.0	2.3
Geology	95	100.0	15.6	10.4	70.1	3.9
Mathematics	398	100.0	6.1	5.8	62.3	25.9
Microbiology	148	100.0	7.0	8.9	84.1	0
Mining and Mineral Engineering	22	100.0	22.2	38.9	38.9	0
Physics	220	100.0	13.4	10.7	59.7	16.1
Physiology	139	100.0	7.0	17.6	66.6	8.8
Psychology	348	100.0	10.8	14.0	73.8	1.4
Sociology	225	100.0	7.6	12.7	74.6	5.1
Zoology	60	100.0	2.2	14.5	76.1	7.2
All Fields	2,980	100.0	10.3	12.0	70.3	7.4

Table 6

Percentage Distribution of Expected Full-Time Faculty Hires by Rank, 1978-79: Public Institutions (N=162)

Field	Total Hires Number	Total Hires Percent	Academic Rank: Professor	Associate Professor	Assistant Professor	Other
Biochemistry	105	100.0	6.8	9.5	80.0	3.7
Biology	127	100.0	11.3	5.9	82.9	0
Botany	49	100.0	7.9	7.9	81.6	2.6
Chemical Engineering	95	100.0	14.5	11.9	73.6	0
Chemistry	144	100.0	10.4	11.2	67.2	11.2
Economics	162	100.0	12.8	10.7	74.2	2.3
Electrical Engineering	174	100.0	7.3	16.5	73.6	2.6
Geology	69	100.0	17.6	10.6	68.3	3.5
Mathematics	256	100.0	7.9	7.4	63.5	21.2
Microbiology	96	100.0	7.7	8.7	83.6	0
Mining and Mineral Engineering	22	100.0	22.2	38.9	38.9	0
Physics	148	100.0	15.6	13.4	53.0	18.0
Physiology	97	100.0	8.6	15.9	72.3	3.3
Psychology	220	100.0	8.9	15.0	74.4	1.7
Sociology	176	100.0	8.2	13.2	74.3	4.2
Zoology	48	100.0	2.7	5.4	89.2	2.7
All Fields	1,995	100.0	10.0	11.7	71.9	6.5

Table 7

Percentage Distribution of Expected Full-Time Faculty Hires by Rank, 1978-79: Private Institutions (N=126)

Field	Total Hires		Academic Rank			
	Number	Percent	Professor	Associate Professor	Assistant Professor	Other
Biochemistry	71	100.0	25.9	21.8	50.2	2.1
Biology	74	100.0	5.0	8.3	83.4	3.3
Botany	4	100.0	0	33.3	66.7	0
Chemical Engineering	49	100.0	18.9	13.5	67.6	0
Chemistry	84	100.0	14.1	12.7	67.5	5.7
Economics	95	100.0	19.0	13.9	60.8	6.3
Electrical Engineering	83	100.0	9.8	23.0	65.6	1.6
Geology	25	100.0	10.0	10.0	75.0	5.0
Mathematics	141	100.0	2.8	2.8	60.2	34.3
Microbiology	51	100.0	5.8	9.3	84.9	0
Mining and Mineral Engineering	0	-	-	-	-	-
Physics	71	100.0	8.8	5.3	73.7	12.3
Physiology	42	100.0	3.6	21.4	53.6	21.4
Psychology	127	100.0	14.1	12.2	72.8	1.0
Sociology	49	100.0	5.4	10.8	75.7	8.1
Zoology	12	100.0	0	50.0	25.0	25.0
All Fields	984	100.0	11.0	12.6	67.1	9.3

Table 8

Percentage Distribution of Expected Full-Time Faculty Hires by Rank, 1978-79: Departments Rated "Distinguished" or "Strong" in the Roose-Andersen Study (Unweighted)

Field	Total Hires		Academic Rank			
	Number	Percent	Professor	Associate Professor	Assistant Professor	Other
Biochemistry	23	100.0	26.1	13.0	56.5	4.3
Biology[a]	-	-	-	-	-	-
Botany	13	100.0	7.7	15.4	76.9	0
Chemical Engineering	24	100.0	12.5	8.3	79.2	0
Chemistry	55	100.0	12.7	12.7	74.5	0
Economics	42	100.0	19.0	9.5	61.9	9.5
Electrical Engineering	70	100.0	5.7	18.6	74.3	1.4
Geology	20	100.0	15.0	15.0	70.0	0
Mathematics	96	100.0	6.3	3.1	46.9	43.8
Microbiology	14	100.0	0	0	100.0	0
Mining and Mineral Engineering[a]	-	-	-	-	-	-
Physics	44	100.0	13.6	6.8	70.5	9.1
Physiology	17	100.0	5.9	17.6	64.7	11.8
Psychology	59	100.0	13.6	11.9	71.2	3.4
Sociology	22	100.0	9.1	9.1	72.7	9.1
Zoology	9	100.0	0	22.2	66.7	11.1
All Fields	508	100.0	10.8	10.6	66.9	11.6

[a]The Roose-Andersen study did not include biology departments as designated in the present study or departments of mining and mineral engineering.

Table 9

Full-Time Doctoral Faculty and Young Doctoral Faculty:
Departments Providing Data for 1974, 1975, and 1977-78
(Unweighted)

Field	Number of Departments	Spring 1974[a] Doctoral Faculty Total Number	Spring 1974[a] Doctoral Faculty Percent Young	December 1975[b] Doctoral Faculty Total Number	December 1975[b] Doctoral Faculty Percent Young	1977-78 Doctoral Faculty Total Number	1977-78 Doctoral Faculty Percent Young
Biochemistry	24	363	23.1	363	20.9	383	15.9
Biology	42	987	28.1	1,033	29.8	988	24.1
Botany	17	303	25.7	306	24.5	346	17.6
Chemical Engineering	24	333	18.9	312	18.6	322	18.3
Chemistry	90	2,189	21.8	2,194	19.6	2,255	18.2
Economics	50	1,129	36.8	1,131	35.4	1,180	33.1
Electrical Engineering	51	1,129	29.1	1,161	27.4	1,251	19.8
Geology	39	628	23.6	614	22.6	645	22.2
Mathematics	71	2,401	27.0	2,472	31.4	2,569	27.8
Microbiology	13	171	24.0	179	26.8	173	19.1
Mining and Mineral Engineering[c]	-	-	-	-	-	-	-
Physics	81	2,070	19.8	2,031	16.8	2,067	13.2
Physiology	9	137	33.6	157	28.7	154	26.0
Psychology	66	1,628	42.5	1,673	39.4	1,719	31.5
Sociology	50	955	46.4	972	40.7	1,002	34.8
Zoology	22	508	29.9	515	28.7	510	26.7
All Fields	649	14,931	30.4	15,113	27.9	15,564	23.7

[a]Source: National Science Foundation, Young and Senior Science and Engineering Faculty, 1974: Support, Research Participation, and Tenure, NSF 75-302 (1975).

[b]Source: F.J. Atelsek and I.L. Gomberg, Young Doctorate Faculty in Selected Science and Engineering Departments, 1975 to 1980, Higher Education Panel Report No. 30 (August 1976).

[c]The field of mining and mineral engineering was not included in the 1974 NSF study.

Table 10

Full-Time Doctoral Faculty and Young Doctoral Faculty:
Departments Providing Data for 1968, 1974, 1975 and 1977-78
(Unweighted)

Field	Number of Departments	Spring 1968[a] Doctoral Faculty		Spring 1974[b] Doctoral Faculty		December 1975[c] Doctoral Faculty		1977-78 Doctoral Faculty	
		Total Number	Percent Young	Total Number	Percent Young	Total Number	Percent Young	Total Number	Percent Young
Biochemistry	8	116	33.6	137	19.7	142	19.0	148	12.8
Biology	19	365	32.3	426	28.9	440	27.5	447	23.5
Botany[d]	-	-	-	-	-	-	-	-	-
Chemical Engineering	17	230	38.3	244	19.3	226	20.4	234	17.1
Chemistry	74	1,712	35.8	1,861	21.2	1,870	19.6	1,914	18.2
Economics	27	643	43.2	662	32.5	664	32.7	671	32.3
Electrical Engineering	32	762	50.4	839	27.2	869	24.2	927	18.6
Geology[d]	-	-	-	-	-	-	-	-	-
Mathematics	43	1,462	52.7	1,672	36.1	1,704	30.8	1,766	28.3
Microbiology	6	87	28.7	85	30.6	95	31.6	88	21.6
Mining and Mineral Engineering[d]	-	-	-	-	-	-	-	-	-
Physics	49	1,230	39.9	1,280	20.2	1,278	17.8	1,323	14.1
Physiology	0	-	-	-	-	-	-	-	-
Psychology	36	873	45.1	974	43.3	1,014	37.3	1,005	30.3
Sociology	22	412	48.1	476	43.3	471	37.4	491	32.8
Zoology[d]	-	-	-	-	-	-	-	-	-
All Fields	333	7,392	43.1	8,656	29.4	8,773	26.5	9,004	23.0

[a]Source: National Science Foundation, Support and Research Participation of Young and Senior Academic Staff, 1968, NSF 68-31 (1968).

[b]Source: National Science Foundation, Young and Senior Science and Engineering Faculty, 1974: Support, Research Participation, and Tenure, NSF 75-302 (1975).

[c]Source: F.J. Atelsek and I.L. Gomberg, Young Doctorate Faculty in Selected Science and Engineering Departments, 1975-1980, Higher Education Panel Report No. 30 (August 1976).

[d]The fields of botany, geology and zoology were not included in the 1968 study; mining and mineral engineering was not included in the 1968 or the 1974 study.

Table 11

Status of Research Proposals Submitted by Full-Time Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977:
All Institutions (N=288)

Field	Total Doctoral Faculty					Young Doctoral Faculty				
		Proposals					Proposals			
	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon
Biochemistry	1,746	2,559	56.0	28.4	15.5	294	537	57.5	31.0	11.3
Biology	3,132	3,572	59.3	32.1	8.5	724	1,065	57.8	32.5	9.6
Botany	842	664	64.2	27.2	8.6	139	170	65.9	24.9	9.1
Chemical Engineering	994	1,431	48.9	36.0	15.1	208	443	43.7	40.2	16.0
Chemistry	3,994	5,397	53.4	32.4	14.3	690	1,347	53.0	32.7	14.2
Economics	2,468	975	60.9	26.3	12.8	845	338	58.0	27.8	14.1
Electrical Engineering	2,355	2,468	53.7	30.0	16.3	479	485	47.0	39.1	13.8
Geology	1,319	1,739	72.0	20.7	7.3	305	417	71.5	20.5	7.8
Mathematics	4,845	1,847	60.8	32.6	6.5	1,298	617	55.9	36.1	7.9
Microbiology	1,385	2,105	58.8	29.0	12.1	328	581	54.6	30.4	14.6
Mining and Mineral Engineering	108	190	69.0	21.9	9.0	25	47	53.8	35.9	10.2
Physics	3,781	2,861	60.9	26.9	11.3	488	436	60.1	26.5	13.3
Physiology	1,505	1,887	57.6	28.6	13.7	405	579	53.3	32.6	14.0
Psychology	4,344	2,554	54.4	36.5	9.0	1,382	925	50.9	39.9	9.0
Sociology	2,140	1,072	54.9	33.5	11.6	775	533	53.5	34.8	11.6
Zoology	998	936	62.8	28.3	8.8	259	307	59.8	30.0	10.1
All Fields	35,962	32,264	57.8	30.4	11.8	8,652	8,835	55.2	33.0	11.8

Table 12

Status of Research Proposals Submitted by Full-Time Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977:
Public Institutions (N=162)

Field	Total Doctoral Faculty					Young Doctoral Faculty				
		Proposals					Proposals			
	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon
Biochemistry	1,194	1,600	54.1	31.1	14.7	186	350	56.2	32.1	11.6
Biology	2,150	2,535	60.0	32.5	7.5	465	723	59.7	32.0	8.2
Botany	777	621	63.1	28.2	8.7	130	163	66.1	[illegible].2	8.6
Chemical Engineering	698	998	45.6	38.8	15.6	132	317	40.6	[illegible].2	16.0
Chemistry	2,930	3,928	53.0	33.1	13.9	462	918	52.5	[illegible].0	13.5
Economics	1,730	681	61.2	27.9	10.9	548	228	57.3	30.2	12.4
Electrical Engineering	1,590	1,726	53.2	31.5	15.2	324	352	46.5	39.3	14.1
Geology	1,017	1,209	69.6	22.0	8.4	222	296	69.3	21.4	9.2
Mathematics	3,758	1,363	55.3	37.4	7.3	967	481	50.5	40.3	9.0
Microbiology	965	1,468	59.4	27.8	12.7	211	382	51.7	30.3	17.9
Mining and Mineral Engineering	108	190	69.0	21.9	9.0	25	47	53.8	35.9	10.2
Physics	2,759	1,997	60.8	28.8	9.1	316	320	61.8	28.5	9.6
Physiology	1,021	1,385	60.9	27.3	11.8	264	386	58.5	29.0	12.3
Psychology	3,089	1,805	54.5	35.5	10.0	951	656	51.9	37.9	10.1
Sociology	1,591	724	55.5	34.0	10.4	559	388	55.5	34.8	9.6
Zoology	930	859	61.3	29.5	9.2	244	276	58.6	30.0	11.2
All Fields	26,314	23,097	57.3	31.4	11.3	6,013	6,290	55.0	33.5	11.5

Table 13

Status of Research Proposals Submitted by Full-Time Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977:
Private Institutions (N=126)

Field	Total Doctoral Faculty					Young Doctoral Faculty				
		Proposals					Proposals			
	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon
Biochemistry	552	959	59.2	23.9	16.9	108	186	60.0	29.1	10.8
Biology	982	1,036	57.7	31.3	11.0	258	341	53.8	33.5	12.6
Botany	64	42	80.6	12.9	6.5	9	6	60.0	20.0	20.0
Chemical Engineering	296	433	56.4	29.4	14.1	75	126	51.5	32.6	15.7
Chemistry	1,063	1,468	54.4	30.2	15.3	227	429	54.3	29.9	15.7
Economics	738	293	60.2	22.5	17.3	296	109	59.5	22.6	17.8
Electrical Engineering	764	741	54.6	26.6	18.8	154	132	48.3	38.7	12.9
Geology	301	530	77.5	17.8	4.7	83	120	77.0	18.3	4.6
Mathematics	1,087	483	76.4	19.2	4.3	331	136	75.0	21.1	3.8
Microbiology	420	637	57.4	31.9	10.7	116	199	60.3	31.3	8.3
Mining and Mineral Engineering	0	-	-	-	-	0	-	-	-	-
Physics	1,022	864	61.2	22.5	16.3	172	116	55.5	21.1	23.3
Physiology	483	502	48.6	32.4	18.9	141	192	42.8	39.8	17.2
Psychology	1,254	748	54.3	39.1	6.5	430	269	48.6	44.9	6.3
Sociology	549	348	53.5	32.4	14.1	216	145	48.3	34.8	16.8
Zoology	67	77	80.0	16.0	4.0	15	30	70.0	30.0	0.0
All Fields	9,647	9,167	58.9	27.9	13.2	2,638	2,544	55.5	31.9	12.5

Table 14

Status of Research Proposals Submitted by Full-Time Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977: Departments Rated "Distinguished" or "Strong" in the Roose-Andersen Study
(Unweighted)

Field	Total Doctoral Faculty					Young Doctoral Faculty				
		Proposals					Proposals			
	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon
Biochemistry	286	546	66.1	17.5	16.3	48	90	76.6	13.3	10.0
Biology[a]	-	-	-	-	-	-	-	-	-	-
Botany	234	194	71.1	24.2	4.6	22	33	78.7	15.1	6.0
Chemical Engineering	207	284	58.5	30.6	10.9	39	82	47.5	42.6	9.7
Chemistry	894	1,306	59.9	22.4	17.7	177	366	53.8	26.2	19.9
Economics	420	176	69.3	18.7	11.9	153	51	72.5	7.8	19.6
Electrical Engineering	750	704	55.4	29.4	15.2	150	107	45.7	40.1	14.0
Geology	314	523	80.5	14.3	5.2	72	96	75.0	18.7	6.2
Mathematics	853	380	85.0	12.8	2.1	225	92	82.6	15.2	2.1
Microbiology	219	321	70.4	14.6	15.0	44	68	57.3	23.5	19.1
Mining and Mineral Engineering[a]	-	-	-	-	-	-	-	-	-	-
Physics	774	489	67.7	16.3	16.0	123	75	60.0	20.0	20.0
Physiology	210	321	74.8	18.3	6.9	36	51	66.6	25.4	7.8
Psychology	769	595	59.2	31.4	9.4	215	196	57.6	34.1	8.1
Sociology	324	154	58.4	37.0	4.5	104	66	57.5	40.9	1.5
Zoology	199	256	69.5	23.8	6.6	51	71	74.6	22.5	2.8
All Fields	6,453	6,249	65.9	22.0	12.0	1,459	1,444	61.4	26.3	12.1

[a]The Roose-Andersen study did not include biology departments as designated in the present study or departments of mining and mineral engineering.

Table 15

Status of Research Proposals Submitted by Full-Time Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977: Twenty Largest Responding Departments[a] (Unweighted)

Field	Total Doctoral Faculty					Young Doctoral Faculty				
		Proposals					Proposals			
	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon	Number of Faculty	Number Submitted	Percent Funded	Percent Rejected	Percent Not Yet Acted Upon
Biochemistry	491	626	62.8	22.8	14.4	65	109	65.1	24.7	10.0
Biology	921	1,045	60.6	32.5	6.9	187	259	59.0	35.9	5.0
Botany	424	374	66.0	26.2	7.8	70	93	67.7	22.5	9.6
Chemical Engineering	321	423	50.8	30.0	19.1	63	124	42.7	39.5	17.7
Chemistry	854	1,248	59.5	26.9	13.6	148	301	54.4	30.5	14.9
Economics	704	216	66.7	25.4	7.9	214	56	60.7	35.7	3.5
Electrical Engineering	875	687	55.6	27.3	17.0	178	117	43.5	41.8	14.5
Geology	430	637	74.9	16.4	8.6	94	123	68.2	17.0	14.6
Mathematics	1,318	551	63.9	29.2	6.9	368	174	55.7	37.3	6.9
Microbiology	382	627	59.0	24.2	16.7	92	177	52.5	25.9	21.4
Mining and Mineral Engineering	88	155	69.0	21.9	9.0	21	39	53.8	35.9	10.2
Physics	1,015	579	68.6	19.8	11.6	130	79	51.9	29.1	18.9
Physiology	456	570	62.5	27.8	9.6	101	146	50.0	37.6	12.3
Psychology	999	606	52.6	33.6	13.7	232	197	53.3	33.5	13.2
Sociology	554	223	56.1	37.2	6.7	186	107	57.9	40.1	1.8
Zoology	516	424	61.8	27.1	11.1	126	128	59.3	27.3	13.2
All Fields	10,348	8,991	61.4	26.8	11.7	2,275	2,229	55.6	32.2	12.0

[a]On the basis of total number of full-time doctoral faculty.

Table 16

Success in Funding Research Proposals Submitted by Young and Senior Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977:
All Institutions (N=288)

Field	Senior Doctoral Faculty				Young Doctoral Faculty			
	Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon		Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon	
			Number	Percent Funded			Number	Percent Funded
Biochemistry	1,452	2,022	1,685	66.7	294	537	476	64.9
Biology	2,407	2,507	2,309	65.2	724	1,065	962	64.0
Botany	702	494	462	72.9	139	[illegible]	155	72.5
Chemical Engineering	786	988	842	60.0	208	443	372	52.0
Chemistry	3,303	4,050	3,491	62.4	690	1,347	1,164	61.8
Economics	1,623	637	560	71.9	845	338	290	67.6
Electrical Engineering	1,875	1,983	1,648	66.5	479	485	418	54.5
Geology	1,013	1,322	1,229	77.6	305	417	384	77.7
Mathematics	3,547	1,230	1,158	67.1	1,298	617	568	60.7
Microbiology	1,057	1,524	1,353	68.4	328	581	496	64.0
Mining and Mineral Engineering	82	143	130	81.1	25	47	43	60.0
Physics	3,292	2,425	2,137	69.4	488	436	378	69.3
Physiology	1,099	1,308	1,135	69.3	405	579	498	62.0
Psychology	2,961	1,629	1,482	61.9	1,382	925	842	56.0
Sociology	1,365	539	475	63.5	775	533	471	60.5
Zoology	738	629	577	70.0	259	307	276	66.5
All Fields	27,310	23,429	20,681	66.8	8,652	8,835	7,798	62.5

Table 17

Success in Funding Research Proposals Submitted by Young and Senior Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977:
Public Institutions (N=162)

Field	Senior Doctoral Faculty				Young Doctoral Faculty			
	Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon		Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon	
			Number	Percent Funded			Number	Percent Funded
Biochemistry	1,007	1,250	1,054	63.4	186	350	310	63.6
Biology	1,684	1,812	1,685	64.8	465	723	664	65.1
Botany	647	458	428	71.7	130	163	149	72.4
Chemical Engineering	565	681	576	56.5	132	317	266	48.4
Chemistry	2,468	3,010	2,609	61.8	462	918	802	60.6
Economics	1,181	453	407	70.3	548	228	200	65.4
Electrical Engineering	1,266	1,374	1,161	65.0	324	352	302	54.1
Geology	795	913	838	75.8	222	296	268	76.4
Mathematics	2,791	882	827	61.7	967	481	437	55.6
Microbiology	753	1,086	967	69.8	211	382	313	63.0
Mining and Mineral Engineering	82	143	130	81.1	25	47	43	60.0
Physics	2,442	1,677	1,502	67.7	316	320	289	68.4
Physiology	757	999	883	69.9	264	386	338	66.8
Psychology	2,137	1,149	1,035	62.1	951	656	590	57.8
Sociology	1,031	336	298	62.6	559	388	350	61.4
Zoology	686	583	534	68.1	244	276	245	66.1
All Fields	20,300	16,807	14,941	65.6	6,013	6,290	5,572	62.1

Table 18

Success in Funding Research Proposals Submitted by Young and Senior Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977: Private Institutions (N=126)

Field	Senior Doctoral Faculty				Young Doctoral Faculty			
	Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon		Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon	
			Number	Percent Funded			Number	Percent Funded
Biochemistry	444	773	631	72.2	108	186	166	67.3
Biology	723	695	623	66.4	258	341	298	61.6
Botany	54	36	34	88.0	9	6	5	75.0
Chemical Engineering	220	307	266	67.5	75	126	106	61.2
Chemistry	835	1,039	881	64.2	227	429	361	64.4
Economics	441	184	153	76.3	296	109	89	72.4
Electrical Engineering	609	609	486	70.0	154	132	115	55.5
Geology	217	410	390	81.5	83	120	115	80.7
Mathematics	755	347	331	80.6	331	136	131	78.0
Microbiology	303	438	286	65.1	116	199	182	65.8
Mining and Mineral Engineering	0	-	-	-	0	-	-	-
Physics	850	748	634	73.6	172	116	89	72.4
Physiology	342	310	251	67.3	141	192	159	51.8
Psychology	824	479	447	61.6	430	269	252	51.9
Sociology	333	203	177	65.1	216	145	121	58.1
Zoology	52	47	43	92.9	15	30	30	70.0
All Fields	7,009	6,623	5,739	69.8	2,638	2,544	2,226	63.5

Table 19

Success in Funding Research Proposals Submitted by Young and Senior Doctoral Faculty in Selected Science and Engineering Departments, July 1976-June 1977: Departments Rated "Distinguished" or "Strong" in the Roose-Andersen Study (Unweighted)

Field	Senior Doctoral Faculty				Young Doctoral Faculty			
	Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon		Number of Faculty	Number of Proposals Submitted	Proposals Acted Upon	
			Number	Percent Funded			Number	Percent Funded
Biochemistry	238	456	376	77.7	48	90	81	85.1
Biology [a]	-	-	-	-	-	-	-	-
Botany	212	161	154	72.7	22	33	31	83.8
Chemical Engineering	168	202	179	70.9	39	82	74	52.7
Chemistry	717	940	782	74.8	177	366	293	67.2
Economics	267	125	114	74.6	153	51	41	90.2
Electrical Engineering	600	597	505	67.5	150	107	92	53.2
Geology	242	427	406	86.0	72	96	90	80.0
Mathematics	628	288	282	87.6	225	92	90	84.4
Microbiology	175	253	218	85.8	44	68	55	70.9
Mining and Mineral Engineering [a]	-	-	-	-	-	-	-	-
Physics	651	414	351	82.1	123	75	60	75.0
Physiology	174	270	252	81.7	36	51	47	72.3
Psychology	554	399	359	66.6	215	196	180	62.7
Sociology	220	88	82	63.4	104	66	65	58.4
Zoology	148	185	170	73.5	51	71	69	76.8
All Fields	4,994	4,805	4,230	76.5	1,459	1,444	1,268	69.9

[a] The Roose-Andersen study did not include biology departments as designated in the present study or departments of mining and mineral engineering.

Table 20

Percentage Distribution of Department Heads' Opinions of the Likelihood of Young Doctoral Faculty to Apply for Independent Research Support Now as Compared with Five Years Ago: All Institutions (N=288)

Field	Departments		Opinions of Likelihood						
	Number[a]	Percent	Very Much Less	Much Less	A Little Less	About as Likely	A Little More	Much More	Very Much More
Biochemistry	122	100.0	0	1.0	5.3	48.0	16.8	25.3	3.2
Biology	133	100.0	.9	3.7	9.9	33.8	19.4	20.8	11.2
Botany	46	100.0	0	2.7	16.5	25.0	11.0	27.8	16.7
Chemical Engineering	94	100.0	1.3	1.3	4.0	37.5	24.7	25.6	5.4
Chemistry	180	100.0	.6	1.9	5.1	43.8	22.6	14.8	10.9
Economics	113	100.0	1.0	2.1	13.0	38.4	23.8	20.3	1.0
Electrical Engineering	110	100.0	1.0	4.2	12.2	34.2	21.0	18.0	9.1
Geology	95	100.0	0	2.5	6.4	32.1	25.5	26.8	6.4
Mathematics	146	100.0	3.4	5.7	7.7	41.6	24.0	12.3	5.0
Microbiology	116	100.0	2.3	4.6	8.1	49.2	16.6	10.4	8.6
Mining and Mineral Engineering	11	100.0	0	11.1	22.2	44.4	11.1	11.1	0
Physics	139	100.0	3.3	6.7	10.3	49.7	11.9	16.1	1.6
Physiolology	104	100.0	1.4	4.5	12.4	45.7	14.4	12.9	8.4
Psychology	170	100.0	2.9	3.5	15.7	24.2	25.5	20.7	7.2
Sociology	121	100.0	0	2.1	9.8	28.0	25.4	22.4	12.0
Zoology	47	100.0	0	5.5	5.5	31.2	27.5	19.2	11.0
All Fields	1,753	100.0	1.4	3.5	9.5	38.3	20.8	18.8	7.3

[a]The number of departments excludes those reporting no young doctoral faculty during 1977-78.

Table 21

Percentage Distribution of Department Heads' Opinions of the Likelihood of Young Doctoral Faculty to Apply for Independent Research Support Now as Compared with Five Years Ago: Public Institutions (N=162)

Field	Departments		Opinions of Likelihood						
	Number[a]	Percent	Very Much Less	Much Less	A Little Less	About as Likely	A Little More	Much More	Very Much More
Biochemistry	74	100.0	0	1.7	6.8	44.3	13.5	30.1	3.3
Biology	76	100.0	1.6	4.9	5.7	33.3	19.3	20.1	14.7
Botany	42	100.0	0	3.0	18.1	24.2	12.1	27.2	15.1
Chemical Engineering	66	100.0	1.9	1.9	5.7	43.3	19.0	22.3	5.7
Chemistry	115	100.0	0	2.0	6.9	40.9	22.0	18.1	9.8
Economics	73	100.0	0	3.3	15.1	34.6	25.2	21.5	0
Electrical Engineering	75	100.0	1.5	4.4	10.6	31.9	24.4	20.9	6.1
Geology	68	100.0	0	3.6	7.2	28.5	26.7	26.7	7.2
Mathematics	97	100.0	2.4	7.2	6.1	34.1	29.3	14.5	6.1
Microbiology	77	100.0	1.5	3.1	7.5	45.5	19.2	13.7	9.1
Mining and Mineral Engineering	11	100.0	0	11.1	22.2	44.4	11.1	11.1	0
Physics	95	100.0	3.5	5.9	7.3	52.9	12.1	15.7	2.4
Physiolology	63	100.0	0	1.8	10.2	57.5	14.2	11.7	4.3
Psychology	111	100.0	3.3	4.3	17.5	25.2	22.0	19.7	7.7
Sociology	79	100.0	0	3.3	10.0	26.1	28.8	21.6	10.0
Zoology	44	100.0	0	5.8	5.8	26.4	29.4	20.5	11.7
All Fields	1,172	100.0	1.2	3.9	9.4	37.1	21.2	19.7	7.2

[a]The number of departments excludes those reporting no young doctoral faculty during 1977-78.

Table 22

Percentage Distribution of Department Heads' Opinions of the Likelihood of Young Doctoral Faculty to Apply for Independent Research Support Now as Compared with Five Years Ago: Private Institutions (N=126)

Field	Departments		Opinions of Likelihood						
	Number[a]	Percent	Very Much Less	Much Less	A Little Less	About as Likely	A Little More	Much More	Very Much More
Biochemistry	47	100.0	0	0	3.1	53.8	21.9	17.9	3.1
Biology	57	100.0	0	2.1	15.3	34.6	19.6	21.6	6.4
Botany	4	100.0	0	0	0	33.3	0	33.3	33.3
Chemical Engineering	27	100.0	0	0	0	23.8	38.1	33.3	4.7
Chemistry	65	100.0	1.8	1.8	1.8	48.8	23.7	9.1	12.8
Economics	39	100.0	3.0	0	9.0	45.4	21.2	18.1	3.0
Electrical Engineering	34	100.0	0	3.9	15.7	39.2	13.6	11.[illegible]	15.7
Geology	27	100.0	0	0	4.5	40.9	22.7	27.2	4.5
Mathematics	48	100.0	5.4	2.7	10.8	56.7	13.5	8.1	2.7
Microbiology	39	100.0	3.9	7.5	9.2	56.4	11.4	3.7	7.5
Mining and Mineral Engineering	0	100.0	-	-	-	-	-	-	-
Physics	43	100.0	2.8	8.5	17.1	42.8	11.4	17.1	0
Physiology	40	100.0	3.6	8.7	15.7	27.2	14.8	14.9	14.8
Psychology	58	100.0	2.0	2.0	12.4	22.3	32.1	22.7	6.2
Sociology	41	100.0	0	0	9.5	31.7	19.0	23.9	15.8
Zoology	3	100.0	0	0	0	100.0	0	0	0
All Fields	581	100.0	1.8	2.8	9.6	40.9	20.0	17.0	7.7

[a]The number of departments excludes those reporting no young doctoral faculty during 1977-78.

Table 23

Percentage Distribution of Department Heads' Opinions of the Likelihood of Young Doctoral Faculty to Apply for Independent Research Support Now as Compared with Five Years Ago: Departments Rated "Distinguished" or "Strong" in the Roose-Andersen Study (Unweighted)

Field	Departments		Opinions of Likelihood						
	Number[a]	Percent	Very Much Less	Much Less	A Little Less	About as Likely	A Little More	Much More	Very Much More
Biochemistry	17	100.0	0	0	0	64.7	11.7	23.5	0
Biology[b]	-	-	-	-	-	-	-	-	-
Botany	8	100.0	0	0	12.5	50.0	0	12.5	25.0
Chemical Engineering	14	100.0	0	0	0	42.8	42.8	14.2	0
Chemistry	28	100.0	0	0	0	53.5	28.5	7.1	10.7
Economics	16	100.0	0	0	12.5	50.0	18.7	18.7	0
Electrical Engineering	19	100.0	0	0	5.2	47.3	36.8	5.2	5.2
Geology	17	100.0	0	0	0	29.4	23.5	41.1	5.8
Mathematics	18	100.0	0	5.5	5.5	55.5	22.2	11.1	0
Microbiology	11	100.0	0	0	0	72.7	9.0	9.0	9.0
Mining and Mineral Engineering[b]	-	-	-	-	-	-	-	-	-
Physics	17	100.0	0	0	5.8	64.7	11.7	17.6	0
Physiolology	11	100.0	0	0	0	81.8	9.0	0	9.0
Psychology	23	100.0	0	0	13.0	30.4	17.3	30.4	8.7
Sociology	14	100.0	0	0	21.4	14.2	42.8	14.2	7.1
Zoology	8	100.0	0	0	0	25.0	37.5	25.0	12.5
All Fields	221	100.0	0	.4	5.4	48.4	23.0	16.7	5.8

[a]The number of departments excludes those reporting no young doctoral faculty during 1977-78.

[b]The Roose-Andersen study did not include biology departments as designated in the present study or departments of mining and mineral engineering.

Table 24

Percentage Distribution of Department Heads' Opinions of Why Young Doctoral Faculty are Now Less Likely to Apply for Independent Research Support: All Institutions

Opinion	First Ranked (N=261)	Second Ranked (N=195)	Third Ranked (N=117)	Fourth Ranked (N=72)
Lack of security in current position	4.6	16.4	31.6	37.5
Heavy teaching loads	21.1	25.1	24.8	23.6
Belief that the selection process is biased against them	35.6	39.5	17.9	5.6
Already receiving support under the umbrella of senior faculty	8.8	10.8	22.2	27.8
Lack of funding	21.1	4.1	.9	0
Other	8.8	4.1	2.6	5.6
Total	100.0	100.0	100.0	100.0

Table 25

Percentage Distribution of Department Heads' Opinions of Why Young Doctoral Faculty Are Now Less Likely to Apply for Independent Research Support: Public Institutions

Opinion	First Ranked (N=176)	Second Ranked (N=131)	Third Ranked (N=85)	Fourth Ranked (N=53)
Lack of security in current position	6.2	17.6	37.6	22.6
Heavy teaching loads	21.6	26.7	21.2	32.1
Belief that the selection process is biased against them	33.5	39.7	17.6	7.5
Already receiving support under the umbrella of senior faculty	8.5	9.9	20.0	34.0
Lack of funding	19.3	3.1	1.2	0
Other	10.8	3.1	2.4	3.8
Total	100.0	100.0	100.0	100.0

Table 26

Percentage Distribution of Department Heads' Opinions of Why Young Doctoral Faculty Are Now Less Likely to Apply for Independent Research Support: Private Institutions

Opinion	First Ranked (N=83)	Second Ranked (N=62)	Third Ranked (N=30)	Fourth Ranked (*)
Lack of security in current position	1.2	14.5	16.7	-
Heavy teaching loads	19.3	22.6	36.7	-
Belief that the selection process is biased against them	41.0	38.7	16.7	-
Already receiving support under the umbrella of senior faculty	9.6	12.9	26.7	-
Lack of funding	25.3	6.5	0	-
Other	3.6	4.8	3.3	-
Total	100.0	100.0	100.0	-

*Departments number less than 25.

APPENDIX A: Survey Instrument

AMERICAN COUNCIL ON EDUCATION
ONE DUPONT CIRCLE
WASHINGTON, D. C. 20036

HIGHER EDUCATION PANEL
(202) 833-4757

May 5, 1978

Dear Higher Education Panel Representative:

Enclosed is the forty-third survey of the Higher Education Panel. Requested by the National Science Foundation, this survey seeks information regarding the likelihood of young doctorate faculty (in selected science and engineering departments) to apply for independent research support.

You will note that, instead of a single institutional response, replies are requested from heads of doctorate-level departments in selected science and engineering fields. A list of the selected fields and an explanation of the survey procedures and enclosed materials are provided on the attached instruction sheet.

The Director of the National Science Foundation has written a letter to department heads explaining the purpose of the survey. His letter appears as the cover page of the questionnaire.

We realize that for some institutions there will be a number of individual departments to contact and that, in some instances, the department head may not be available during the survey period. In such cases the acting department head or the department's director of graduate studies should be asked to complete the questionnaire. (Since many department heads may soon be leaving for the summer, we urge you to circulate the questionnaires as soon as possible.)

Please understand that responses from your institution will be held in strictest confidence. As with all our surveys, the data you provide will be reported in summary fashion only and will not be identified with your institution. This survey is authorized by the National Science Foundation Act of 1950, as amended. While you are not required to respond, your cooperation is needed to make the results comprehensive, reliable, and timely.

We would appreciate having the completed questionnaires returned to us by May 26, 1978. A self-addressed, stamped envelope has been enclosed for your convenience. We ask that you <u>not</u> delay the return of completed questionnaires past the due date even if some of the departmental replies are missing. Those you receive after the due date should be forwarded as soon as possible.

If you or the department heads have any questions or problems with the survey procedures, please do not hesitate to telephone us (collect) at (202) 833-4757.

Thank you for your continued cooperation.

Sincerely,

Frank J. Atelsek

Encls.

Frank J. Atelsek, Director

American Council on Education
Higher Education Panel Survey Number 43

Research Support for Full-Time Doctorate Faculty in Selected Science and Engineering Departments

GENERAL INSTRUCTIONS

Enclosed in this package are the following materials:

1. Multiple copies of the questionnaire including an introductory letter from Richard C. Atkinson, Director of the National Science Foundation. Please distribute these as soon as possible to the heads of selected science and engineering departments (see list below).

2. Cover Sheet to accompany completed questionnaires. Please use this form to indicate the departments: (1) for which completed questionnaires are being submitted, and (2) for which completed questionnaires will be submitted later.

3. Prepaid, self-addressed return envelope.

Please return completed questionnaires to the Higher Education Panel by May 26, 1978. Questionnaires completed after that date should be returned to us individually as soon as possible.

SELECTED SCIENCE AND ENGINEERING DEPARTMENTS (DOCTORATE-GRANTING ONLY)

(Do not forget to include appropriate medical school departments.)

BIOCHEMISTRY - Include departments of biochemistry or biological chemistry.

BIOLOGY - Include only departments designated as biology or biological science. Do not include departments covering only specialized fields such as cellular biology or molecular biology.

BOTANY - Include departments of botany or botany combined with other subjects, e.g., department of botany and plant pathology.

CHEMICAL ENGINEERING

CHEMISTRY

ECONOMICS - Do not include departments of agricultural economics.

ELECTRICAL ENGINEERING

GEOLOGY - Include only departments designated as geology or geological science.

MATHEMATICS - Do not include departments limited to applied mathematics, computer science, or statistics.

MICROBIOLOGY - Include only departments designated as microbiology or bacteriology.

MINING AND MINERAL ENGINEERING

PHYSICS - Include only departments designated as physics or physics and astronomy. Do not include highly specialized departments such as molecular physics or electrophysics.

PHYSIOLOGY - Include departments of physiology or physiology combined with other subjects, e.g., department of physiology and biophysics.

PSYCHOLOGY - Do not include highly specialized departments or fields of education such as departments of child development, child studies, educational psychology, or counseling.

SOCIOLOGY - Include departments designated as sociology or sociology and anthropology.

ZOOLOGY - Include departments of zoology or zoology combined with other subjects, e.g., department of zoology and entomology.

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

nsf

OFFICE OF THE
DIRECTOR

May 5, 1978

Dear Colleague:

The National Science Foundation has previously conducted surveys to gain information about the status of young doctorate faculty in college and university science and engineering departments. Thus, for example, a Higher Education Panel survey conducted for the Foundation found in 1976 that in 450 matched science and engineering doctorate departments the percentages of young doctorate faculty had declined from 43 percent in 1968 to 29 percent in 1974 and to 27 percent in December 1975.

This survey will assist in further monitoring developments pertaining to young doctorate faculty. In addition to numbers of faculty we also need information on their success in obtaining research support and their attitude toward seeking research support. These matters may affect the vigor of teaching and scientific research at universities. To meet this need, we have asked the American Council on Education to conduct this fast-response survey through the Higher Education Panel.

This questionnaire is being sent to you and to heads of other selected departments in a sample of institutions granting doctorates in the sciences. Since the sample is not large, it is important that your answers be included along with those of others in your field. Your helpfulness in assisting us in this endeavor by completing the questionnaire promptly will be appreciated. The American Council on Education will publish a report of survey findings, probably in the fall. As in the case with all Higher Education Panel surveys, the confidentiality of the data you provide will be safeguarded.

We trust that you share our interest in this matter and thank you for your assistance

Sincerely,

Richard Atkinson

Richard C. Atkinson
Director

INSTRUCTIONS AND DEFINITIONS

Coverage

This questionnaire should be completed for each *doctorate-granting* department (including those in medical schools) in the designated science and engineering fields. Please return the completed questionnaire to your institution's Panel Representative a few days before May 26 so that it may be forwarded with other questionnaires from your institution to the Higher Education Panel of the American Council on Education.

Full-Time Faculty

The questions herein relate to all regular full-time doctorate faculty assigned to your department, including instructors and assistant professors. Please do not include the following as regular full-time faculty: visiting professors, post-doctorates and research associates, graduate students, or others who are not regular full-time members of your departmental faculty. Be sure to include yourself.

Please note that this questionnaire has been distributed to heads of doctorate-level departments in the following fields:

Biochemistry	Chemistry	Mathematics	Physiology
Biology	Economics	Microbiology	Psychology
Botany	Electrical Engineering	Mining & Mineral Engrg	Sociology
Chemical Engineering	Geology	Physics	Zoology

If any full-time faculty who serve half-time in your department also serve half-time in one of the above departments, please confer with the head of the other department to decide who will provide the information about those faculty. The reporting department should provide information as if the individuals were assigned solely to that department. Do not include in this report any regular full-time faculty serving less than half-time in your department. Faculty employed part-time at your institution should also be excluded from this report.

Faculty members are defined as "young" if they have held their doctorate for seven years or less. Please note that some faculty considered "young" in question 2 may not be "young" in question 1 since the questions refer to different years.

NOTE

If you have any questions, please call the Higher Education Panel staff (collect at (202) 833-4757.

OMB#099-R0265 exp. 6/81

AMERICAN COUNCIL ON EDUCATION
Higher Education Panel Survey No. 43

Research Support for Full-Time Doctorate Faculty in Selected Science and Engineering Departments

Name of Department _____

1. Number of full-time doctorate faculty in 1977-78: Total____ Young*____

2. Research proposals submitted from July 1976 through June 1977 by full-time doctorate faculty to any source for support:

	Total	Young*
a. Number of proposals submitted	____	____
b. Number in (a) that were funded	____	____
c. Number in (a) that were rejected	____	____
d. Number in (a) that have not yet been acted upon	____	____

3. Are young doctorate faculty members now less likely to submit applications for independent research project support than they were five years ago? Circle the appropriate number.

Very much less likely	Much Less	A little less	About as likely	A little more	Much more	Very much more likely
1	2	3	4	5	6	7

4. If you circled number 1, 2, or 3 on the above scale, what are the reasons? Please rank in order of importance:

	Rank
Lack of security in current position	_____
Heavy teaching loads	_____
Belief that the selection process is biased against them	_____
Already receiving support under the umbrella of senior faculty	_____
Other (explain) _____	_____

5. How many full-time doctorate faculty, excluding visiting faculty, do you currently expect to hire for 1978-79? Please give your best estimate of the number of these hires by academic rank:

Total expected hires _____

Professor _____
Associate professor _____
Assistant professor _____
Other _____

*Faculty members are defined as "young" if they have held the doctorate for seven years or less--since 1970-71 for question 1, and since 1969-70 for question 2.

Thank you for your assistance.
Please return this form by May 26, 1978 to:

Higher Education Panel
American Council on Education
One Dupont Circle, N.W.
Washington, D.C. 20036

Please keep a copy of this survey for your records. Person completing this survey:

_____(name)
_____(dept.)
_____(tel,)

American Council on Education
Higher Education Panel Survey Number 43

Research Support for Full-Time Doctorate Faculty in Selected Science and Engineering Departments

COVER SHEET

(to accompany completed questionnaires)

Reports are requested only for departments granting the doctorate degree. Please make appropriate notations for each departmental questionnaire submitted or to be submitted.

Eligible Departments at Your Institution*	Completed Survey Enclosed (✓)	Survey to be Submitted by: (Indicate date)
Biochemistry		
Biology		
Botany		
Chemical Engineering		
Chemistry		
Economics		
Electrical Engineering		
Geology		
Mathematics		
Microbiology		
Mining and Mineral Engineering		
Physics		
Physiology		
Psychology		
Sociology		
Zoology		

Please draw lines through departments listed above that are not doctorate-level departments at your institution.

Name of Institution

Person to be called regarding departmental forms to be submitted at a later date

Phone Number

AMERICAN COUNCIL ON EDUCATION
ONE DUPONT CIRCLE
WASHINGTON, D. C. 20036

HIGHER EDUCATION PANEL
(202) 833-4757

June 9, 1978

Dear Higher Education Panel Representative:

On May 5, 1978, we mailed to you Higher Education Panel Survey #43, "Research Support for Full-time Doctorate Faculty in Selected Science and Engineering Departments." As of today, we are missing completed questionnaires from the following departments:_____

_____

_____

To accelerate the completion of this survey, please forward as soon as possible any completed departmental questionnaires you may be holding, and mail any subsequent responses as soon as you receive them.

Would you please help us update your institution's status by checking the appropriate box below:

☐ Questionnaires from all above departments already mailed.

☐ Questionnaires from all above departments enclosed.

☐ Some questionnaires enclosed. Remaining questionnaires will be returned by_____.

☐ Other (specifv)_____.

Please return this letter and any completed questionnaires in the enclosed self-addressed stamped envelope as soon as possible. If you or any of the departmental respondents have questions about the survey, please call us collect at (202) 833-4757.

Thank you for your cooperation.

Sincerely,

Frank Atelsek

Frank Atelsek
Director

APPENDIX B: Methodology

On May 5, 1978, the survey instrument was mailed to the 235 Panel institutions out of a total population of 288 that award the Ph.D. degree. Questionnaires were directed to the heads of 16 doctorate-level science and engineering departments. After mail and telephone followup efforts, usable data were received from 86 percent of Panel institutions and 1,366, or 81 percent of surveyed departments.

Survey responses were weighted on the assumption that within each stratification cell the departmental structures of Panel institutions are representative of the departmental structures of all institutions in the eligible population. Weights were computed in two stages: the first stage adjusted for departmental nonresponse within responding institutions; and the second adjusted for institutional nonresponse.

Response Analysis

Institutional respondents were basically similar to nonrespondents with few exceptions. Institutions with small graduate enrollments (less than 200 FTE) had a lower-than-average response rate, as did private four-year colleges (71 percent each). The highest response rate was recorded for institutions enrolling more than 5,000 graduate students (94 percent).

Comparison of Respondents and Nonrespondents

Characteristic	Respondents (N=203)	Nonrespondents (N=32)	Response Rate
Total	100.0	100.0	86.4
Control			
Public	64.0	59.4	87.2
Private	36.0	40.6	84.9
Type			
Public university	48.8	34.4	90.0
Private university	30.0	25.0	88.4
Public four-year college	15.3	25.0	79.5
Private four-year college	5.9	15.6	70.6*
Census region			
East	26.7	31.2	84.4
Midwest	23.8	15.6	90.6
South	32.7	28.1	88.0
West	16.8	25.0	81.0
Graduate FTE enrollment			
< 200	8.4	21.9	70.8*
201 - 1,000	23.6	34.4	81.4
1,001 - 5,000	47.3	28.1	91.4
3,001 - 5,000	12.3	12.5	86.2
> 5,000	8.4	3.1	94.4

*Falls short of overall response rate by more than 10 percent.

Sampling Error

Because of the nature of both the Panel and the survey sample, no estimates of sampling error were computed. The population of institutions is stratified into 18 cells. The first eight, termed "certainty" cells, are self representing: All were invited to participate in the Panel during its revision in 1976. For each of the remaining ten cells, probability samples of institutions were drawn.

For this particular survey, the population was limited to 288 Ph.D.-granting institutions, 82 percent of which are Panel members. Further, 96 percent of the Ph.D.-granting institutions within the Panel are in the certainty cells; only ten institutions are in probability cells. Therefore, the computation of sampling error for ten institutions was not considered necessary.

Other Reports of the Higher Education Panel
American Council on Education

El-Khawas, E. H. and Kinzer, J. L. **The Impact of Office of Education Student Assistance Programs, Fall 1973.** Higher Education Panel Report, No. 18, April, 1974.

El-Khawas, E. H. and Kinzer, J. L. **Enrollment of Minority Graduate Students at Ph.D. Granting Institutions.** Higher Education Panel Report, No. 19, August, 1974.

El-Khawas, E. H. **College and University Facilities: Expectations of Space and Maintenance Needs for Fall 1974.** Higher Education Panel Report, No. 20, September, 1974.

Kinzer, J. L. and El-Khawas, E. H. **Compensation Practices for Graduate Research Assistants: A Survey of Selected Doctoral Institutions.** Higher Education Panel Report, No. 21, October, 1974.

El-Khawas, E. H. and Furniss, W. T. **Faculty Tenure and Contract Systems: 1972 and 1974.** Higher Education Panel Report, No. 22, December, 1974.

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Atelsek, Frank J. and Gomberg, Irene L. **Bachelor's Degrees Awarded to Minority Students, 1973-74.** Higher Education Panel Report, No. 24, January, 1977.

Atelsek, Frank J. and Gomberg, Irene L. **Nonfederal Funding of Biomedical Research and Development: A Survey of Doctoral Institutions.** Higher Education Panel Report, No. 25, July, 1975.

Gomberg, Irene L. and Atelsek, Frank J. **Major Field Enrollment of Junior-Year Students, 1973 and 1974.** Higher Education Panel Report, No. 26, April, 1976.

Atelsek, Frank J. and Gomberg, Irene L. **Student Assistance: Participants and Programs, 1974-75.** Higher Education Panel Report, No. 27, July, 1975.

Atelsek, Frank J. and Gomberg, Irene L. **Health Research Facilities: A Survey of Doctorate-Granting Institutions.** Higher Education Panel Report, No. 28, February, 1976.

Atelsek, Frank J. and Gomberg, Irene L. **Faculty Research: Level of Activity and Choice of Area.** Higher Education Panel Report, No. 29, January, 1976.

Atelsek, Frank J. and Gomberg, Irene L. **Young Doctorate Faculty in Selected Science and Engineering Departments, 1975 to 1980.** Higher Education Panel Report, No. 30, August, 1976.

Atelsek, Frank J. and Gomberg, Irene L. **Energy Costs and Energy Conservation Programs in Colleges and Universities: 1972-73 and 1974-75.** Higher Education Panel Report, No. 31, April, 1977.

Atelsek, Frank J. and Gomberg, Irene L. **Foreign Area Research Support Within Organized Research Centers at Selected Universities, FY 1972 and 1976.** Higher Education Panel Report, No. 32, December, 1976.

Atelsek, Frank J. and Gomberg, Irene L. **College and University Services for Older Adults.** Higher Education Panel Report, No. 33, February, 1977.

Atelsek, Frank J. and Gomberg, Irene L. **Production of Doctorates in the Biosciences, 1975-1980: An Experimental Forecast.** Higher Education Panel Report, No. 34, November 1977.

Gomberg, Irene L. and Atelsek, Frank J. **Composition of College and University Governing Boards.** Higher Education Panel Report, No. 35, August, 1977.

Atelsek, Frank J. and Gomberg, Irene L. **Estimated Number of Student Aid Recipients, 1976-77.** Higher Education Panel Report, No. 36, September, 1977.

Atelsek, Frank J. and Gomberg, Irene L. **International Scientific Activities at Selected Institutions, 1975-76 and 1976-77,** Higher Education Panel Report, No. 37, January, 1978.

Atelsek, Frank J. and Gomberg, Irene L. **New Full-Time Faculty 1976-77: Hiring Patterns by Field and Educational Attainment,** Higher Education Panel Report, No. 38, March 1978.

Gomberg, Irene L. and Atelsek, Frank J. **Nontenure-Track Science Personnel: Opportunities for Independent Research,** Higher Education Panel Report, No. 39, September 1978.

Atelsek, Frank J. and Gomberg, Irene L. **Scientific and Technical Cooperation with Developing Countries, 1977-78,** Higher Education Panel Report, No. 40, August 1978.

Atelsek, Frank J. and Gomberg, Irene L. **Special Programs for Female and Minority Graduate Students,** Higher Education Panel Report, No. 41, November 1978.

Single copies of the above reports may be obtained from the Higher Education Panel, American Council on Education, One Dupont Circle, Washington, D.C. 20036.